An Earthquake Just Occurred – Can I Read About It on NOAA's Tsunami Warning Centers' Websites?

That depends… NOAA's tsunami warning centers analyze seismic data with two things in mind: the perceived tsunami threat from coastal shaking and actual tsunami threats. NOAA obtains seismic data from various sources, including the United States Geological Survey (USGS), the authoritative Federal agency with responsibility for recording and reporting earthquake activity nationwide. According to the West Coast/Alaska Tsunami Warning Center Director Paul Whitmore, "Seismic data are critical to a tsunami warning center's operation. Without it, we could not warn for tsunami until after the wave impacts the nearest coast. With it, we can provide an early alert in most situations."

Obviously, not all earthquakes generate tsunamis. NOAA's tsunami warning centers process seismic data rapidly to determine whether the threat of a tsunami exists and whether coastal shaking occurred that might frighten citizens. Because of the warning centers' requirement to issue early tsunami alerts, they are usually the first agencies worldwide to report earthquake occurrences. Initial tsunami messages are produced based on the first analysis of seismic data. If coastal shaking occurred but no tsunami threat exists, the tsunami center monitoring that area quickly issues a message to alleviate concern for coastal residents. On the other hand, if a tsunami may have been generated, a message to that effect is issued. Sea level data, tsunami models, and historical tsunami information are analyzed to estimate impact level. As more sea level data becomes available from deep-ocean pressure sensors and coastal tide gauges, and forecasts are determined, supplemental messages are issued. Earthquakes that do not cause coastal shaking or provide any tsunami threat are not displayed on NOAA's tsunami warning center websites. To view information about earthquakes around the world, visit the USGS Earthquake Hazards Program site.

NOAA operates both United States tsunami warning centers, the West Coast / Alaska Tsunami Warning Center (WC/ATWC) in Palmer, Alaska and the Pacific Tsunami Warning Center (PTWC) in Ewa Beach, Hawaii.

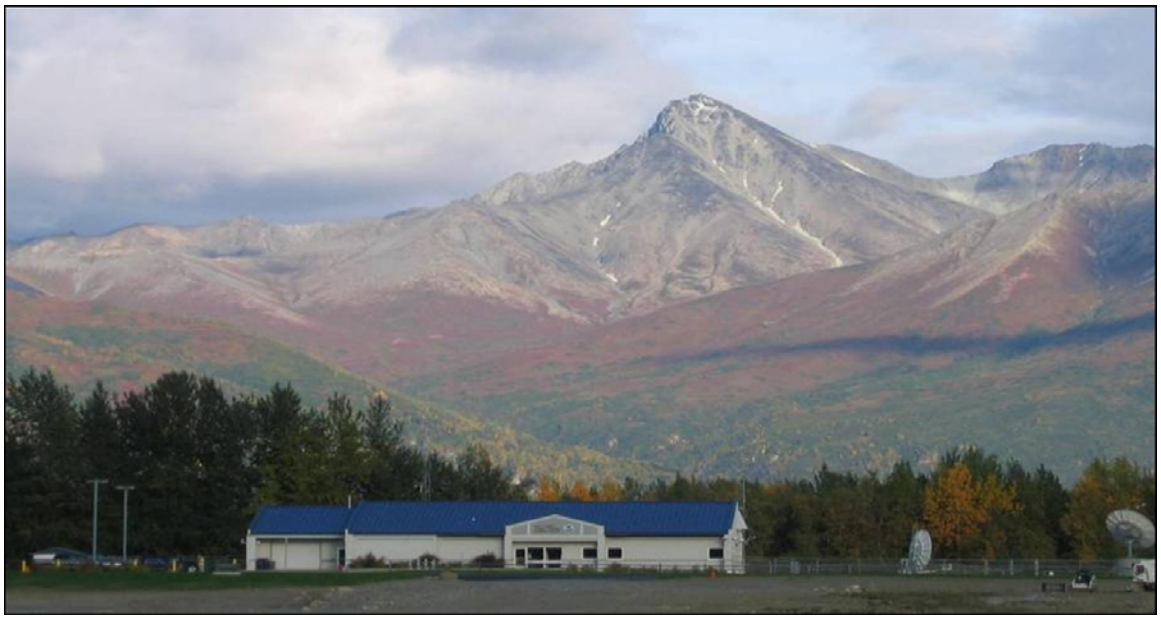

Figure 1: West Coast/Alaska Tsunami Warning Center in Palmer, Alaska. Photo Credit: Bill Knight

Figure 2: Richard H. Hagemeyer Pacific Tsunami Warning Center, Honolulu, Hawaii, Photo Credit: NOAA

Like Weather Forecast Offices, each center has its own geographical area of responsibility for which it disseminates messages and provides interpretive information to emergency managers and other officials, news media, and the public. The yellow coastline on the figure below is served by the WC/ATWC, and the white coastline is served by the PTWC. However, each is capable of providing backup services for the other.

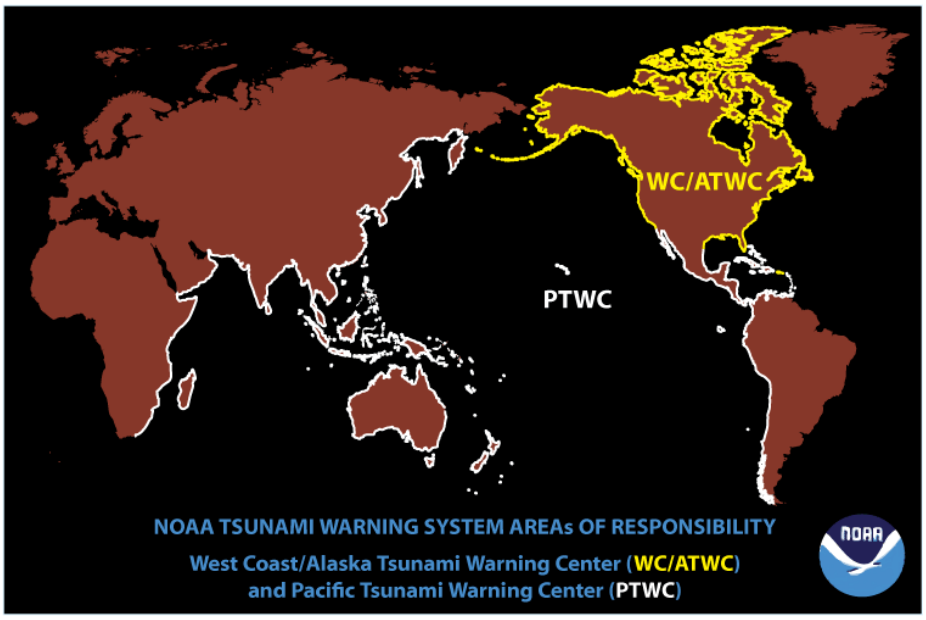

Figure 3: NOAA Tsunami Warning System Areas of Responsibility

The world's tsunami warning systems are coordinated by the United Nations Intergovernmental Oceanographic Commission (IOC). NOAA's West Coast / Alaska Tsunami Warning Center provides warnings for the eastern, western and arctic coasts of the continental United States and Canada, the Gulf of Mexico, Puerto Rico, and the Virgin Islands. NOAA's Pacific Tsunami Warning Center provides warnings for Pacific basin tsunamis to all countries and Pacific island states around the Pacific rim, outside the WCATWC area of responsibility. PTWC serves as an interim tsunami warning center for countries bordering the Indian Ocean, Caribbean Sea, and South China Sea.

In addition to the two U.S. tsunami warning centers, the Japan Meteorological Agency also has a well-developed tsunami warning system with multiple warning centers. Following the 2004 Indian Ocean tsunami, other warning centers have been established in Indonesia, Australia, India, and Thailand.

The bottom line is that NOAA's tsunami warning centers analyze seismic data, but only to the extent that it relates to tsunami response. The USGS provides and applies relevant earthquake science information and knowledge for reducing deaths, injuries, and property damage from earthquakes. NOAA and the USGS work together to provide earthquake and tsunami related information to customers.